

**METHOD AND APPARATUS FOR INTEGRATING RESOLUTION SERVICES,
REGISTRATION SERVICES, AND SEARCH SERVICES**

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Other Applications

This application claims priority to U.S. Provisional Application Ser. No. 60/157,075 filed October 1, 1999, by Schneider, entitled "Method and apparatus for integrating resource location and registration services of valid and fictitious domain names", U.S. Provisional Application Ser. No. 60/160,125 filed October 18, 1999, by Schneider, entitled "Method and system for integrating resource location, search services, and registration services", U.S. Patent Application Ser. No. 09/525,350 filed March 15, 2000, by Schneider, entitled "Method for integrating domain name registration with domain name resolution, U.S. Patent Application Ser. No. 09/532,500 filed March 21, 2000, by Schneider, entitled "Fictitious domain name method, product, and apparatus.", and PCT Application No. 00/10883 filed April 20, 2000, by Schneider, entitled "Method for integrating domain name registration with domain name resolution." which are herein incorporated by reference.

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Field of the Invention

This invention generally relates to information services, and more specifically relates to a method and apparatus for integrating resolution services, registration services, and search services.

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Background of the Invention

The Internet is a vast computer network consisting of many smaller networks that span the world. A network provides a distributed communicating system of computers that are interconnected by various electronic communication links and computer software protocols. Because of the Internet's distributed and open network architecture, it is possible to transfer data from one computer to any

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other computer worldwide. In 1991, the World-Wide-Web (WWW or Web) revolutionized the way information is managed and distributed.

5 The Web is based on the concept of hypertext and a transfer method known as Hypertext Transfer Protocol (HTTP) which is designed to run primarily over a Transmission Control Protocol/Internet Protocol (TCP/IP) connection that employs a standard Internet setup. A server computer may issue the data and a client computer displays or processes it. TCP may then convert messages into streams of packets at the source, then reassemble them back into messages at
10 the destination. Internet Protocol (IP) handles addressing, seeing to it that packets are routed across multiple nodes and even across multiple networks with multiple standards. HTTP protocol permits client systems connected to the Internet to access independent and geographically scattered server systems also connected to the Internet.

15 Client side browsers, such as Netscape Navigator and/or Microsoft Internet Explorer (MSIE) provide a graphical user interface (GUI) based client applications that implement the client side portion of the HTTP protocol. One format for information transfer is to create documents using Hypertext Markup
20 Language (HTML). HTML pages are made up of standard text as well as formatting codes that indicate how the page should be displayed. The client side browser reads these codes in order to display the page. A web page may be static and requires no variables to display information or link to other predetermined web pages. A web page is dynamic when arguments are passed
25 which are either hidden in the web page or entered from a client browser to supply the necessary inputs displayed on the web page. Common Gateway Interface (CGI) is a standard for running external programs from a web server. CGI specifies how to pass arguments to the executing program as part of the HTTP server request. Commonly, a CGI script may take the name and value
30 arguments from an input form of a first web page which is be used as a query to access a database server and generate an HTML web page with customized

community of institutional networks, while country code top-level domains (ccTLDs) were created for use by each individual country, as deemed necessary. More than 240 national, or country-code TLDs (e.g., United States (.us), Japan (.jp), Germany (.de), etc.) are administered by their corresponding governments, or by private entities with the appropriate national government's acquiescence. A small set of gTLDs does not carry any national identifier, but denote the intended function of that portion of the domain space. For example, ".com" was established for commercial networks, ".org" for not-for-profit organizations, and ".net" for network gateways. The set of gTLDs was established early in the history of the DNS and has not been changed or augmented in recent years (COM, ORG, GOV, and MIL were created by January 1985, NET in July 1985, and INT was added in November 1988).

A growing set of tools and services have enabled users to choose many techniques suited for improved navigation and access to content on a network such as the Internet. Different services are used to access desired content. There are resolution services for the DNS which receives a domain name (e.g., "example.com) from a client for translation into an IP address to access the resources of a specific network addressable device (e.g., web server) on a network such as the Internet. The function of translating a domain name into a corresponding IP address is known as name resolution. Name resolution is performed by a distributed system of name servers that run specialized software known as resolvers to fulfill the resource location request of the client by the successive hierarchical querying of the resource records from zone files.

There are registration services such as the registration of domain names. Domain name registration for a given Network Information Center (NIC) authority may be accessed by a TCP/IP application called WHOIS, which queries a NIC database to find the name of network and system administrators, system and network points-of-contact, and other individuals who are registered in appropriate databases. Domain names are identifiers used for accessing resources and

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retrieving registrant domain name information. The availability of a domain name from a NIC authority for a given TLD is determined by submitting a WHOIS request. Resource location is determined by resolving a query in the DNS and domain name availability is determined by using a WHOIS service to query an appropriate NIC database.

There are search services to access searchable databases of network resources that are relied upon daily by millions of users. When a client system receives a search request, a query may be sent to a server connected to the Internet to retrieve Uniform Resource Locators (URLs) that satisfy the search request. Web page results are typically generated and displayed to the client in a batch of hyperlinks that access network resources.

In general, these areas remain as separate services and only a few examples may be demonstrated with respect to the integration of these separate areas. For instance, steps for integration of services have been demonstrated in U.S. Provisional Application Ser. No. 60/130,136 filed April 20, 1999, by Schneider entitled "Method and system for integrating resource location and registration services", U.S. Provisional Application Ser. No. 60/160,125 filed October 18, 1999, by Schneider, entitled "Method and system for integrating resource location, search services, and registration services", and U.S. Patent Application Ser. No. 09/525,350 filed March 15, 2000, by Schneider, entitled "Method for integrating domain name registration with domain name resolution."

U.S. Patent 5,778,367 issued on July 7, 1998 by Wesinger Jr., et al., entitled, "Automated on-line information service and directory, particularly for the world wide web" provides a graphical front end to the WHOIS database, with additional hypertext link integration. Links are embedded in the results such that, clicking on a specific result, WHOIS is queried once again with respect to the selected information. This action would produce the same result as if the user had copied down the selected information, navigated to WHOIS and entered the selected

information in the lookup field. The '367 patent automates the WHOIS tool with respect to itself and does not consider automating extended functions of resolution requests or search requests to access other network resources.

- 5 Due to domain name registration growth, it requires more labor to find a desirable domain name that is available. As a result companies such as Oingo, Inc., for example, now provide domain name variation services that help registrars increase domain name sales by identifying and suggesting words and phrases related in meaning to the terms sought to be registered. Other
- 10 improvements to registration services include generating permutations of available domain names in response to supplying a plurality of keywords as a part of a registration request. Currently, the only way to register a domain name is by initiating a registration request. There are no services that combine the use of other requests (e.g., search request, resolution request, etc.) in response to
- 15 an initiated registration request.

- Resolution requests are most commonly generated in response to input provided to the location field of a web browser. The main use of a web browser location field is for resolving URLs to access resources. Entering a URL in the location
- 20 field serves as a means to access that URL. Because the function of the location field is critical for accessing resources, the design of such location fields have rived much competition and innovation between existing web browser products from companies such as Netscape and Microsoft. Improvements to better track and organize sites of URLs that users have visited such as
- 25 Bookmark folders, URL history, and the personal toolbar are all examples of functionality designed to help users navigate. Other improvements include spell checking and an autocomplete feature from the URL history as text is entered into the location field.

- 30 A more recent feature called Smart Browsing is integrated into Netscape Navigator that uses Internet Keywords so users may streamline the use of URLs

and get fast access to web sites using the browser's location field. Any single or multiword strings typed into the browser's location field that does not include a "." are sent via HTTP to a server at "netscape.com". The keyword server pulls the string and compares it to several separate lists of keyword-URL pairs. If the keyword system finds a match, it redirects the user's browser to the URL of the keyword-URL pair. Failing a match against the lists, the user's browser is redirected to a Netscape Search page with the typed string as the search query. The "." versus " " is a key factor in determining what services are used. The detection of a "." implies a domain name whereas the detection of a " " implies a search request.

The autosearch feature of Microsoft Internet Explorer (MSIE) is another example of an improvement to the location field of a web browser. The details of the autosearch feature is disclosed in U.S. Patent 6,009,459 issued on December 28, 1999 by Belfiore, et al., entitled, "Intelligent automatic searching for resources in a distributed environment." The '459 patent specifies a mechanism for a computer system to automatically and intelligently determine what a user intended when the user entered text within the location field of a web browser. Often users improperly enter URLs or enter search terms in a user interface element that requires URLs. If the user enters text that is not a URL, the system may first try to construct a valid URL from the user-entered text. If a valid URL can not be constructed, the browser then automatically formats a search engine query using the user-entered text and forwards the query to an Internet search engine.

In addition, the '459 patent specifies a template registry that categorizes the specific suitability of a plurality of search engines to locate web sites related to a determined meaning of the specified text. The template is an entry in the registry that includes replaceable characters that may be replaced with the processed text. An example template registry entry that causes the Yahoo! search engine

to be called is "http://msie.yahoo.com/autosearch?%s". The %s is filled in with information regarding the search terms.

Furthermore, the '459 patent specifies a method which provides for automatically deleting prefix terms from input that are identified as not necessary to perform a search based on the determined meaning of the entered input. Directive terms such as "go" or "find" followed by search terms may be entered within the location field. Such users intend for the web browser to locate web pages that are identified by terms within the text. As the directive terms do not contain content that is useful in conducting a search, these prefix terms are dropped from the text. Though prefixes may help process keywords in a more specific way, there are no such prefixes in use for specifying how domain names may be processed through a user interface element used for search requests, resolution requests, and registration requests. For example, search engine web sites have specified a list of prefixes to assist in performing a more specific search request. Any such prefixes have no relevance to domain names [e.g., valid domain names (VDNs) and fictitious domain names (FDNs)] but to that of keywords and phrases.

There have been advances with respect to submitting keyword search requests to search engines. RealNames and other companies like Network use plain language as a means for resource location and have developed their own version of resolution services. Using simplified network addresses in the form of keywords/phrases as opposed to the conventional form of URLs in the DNS, offers the possibility to further contemplate the differences between search requests and resource location. Though an observable fact, little if any has been done to provide integration tools to support these differences. To date, the only advancement demonstrated are the partnerships made with RealNames and different portal web sites. When a search request is performed, input may be forwarded to a RealNames server concurrent with the original search request and if there are any matches, the first result displayed may be a registered

RealName which links to a registered web site followed by displaying the search results from the search request.

Though RealNames demonstrates using keywords and phrases from a search request for resource location, there are no methods for detecting a domain name or URL as input from a search request. In effect, a domain name is processed as a literal string or keyword. For example, when a popular web site such as "news.com" is processed from input there is a high probability that the URL "http://news.com" would be displayed within the top few search results. There are no systems that provide such a URL as a first result. However, when a domain name is reserved and has no web site or the domain name corresponds to a web site with little traffic (e.g., web pages having no META tags, etc.), there are no search results, and in turn, no hyperlinks are displayed. This observation is apparent upon surveying the search results of hundreds of search engines, which clearly indicate that a domain name is processed as a literal string only without consideration for processing input in any way aside from that of a search request. There have been some improvements by providing links to other vendors such as processing the search request and responding with a link for a book search at "amazon.com" or the like, but there are no such links that provide vendor domain name related services or online identity services in response to a search request.

Fig. 1a depicts a typical output from a search portal web site for the input "zipnames.com". Results are returned to output such as "found no document matching your query", and generates hyperlinks that use the input as a search request from another URL. Such links may redirect to shopping sites and reference sites or to other search engines. Figs. 1b and 1c depict output from a metasearch site for the input "zipnames.com". Again, the output depicts links that are generated for searching input at another web address. It is clear from these results that no provisions have been made to detect the presence of a domain name before processing a search request.

If a search request may detect that a domain name is processed as is and/or as a network address then steps of resource location and the use of resolution services or registration services may be made in addition to the search request.

- 5 No search engines or existing services make use of the "." delimiter to extend searching into the realm of processing resolution and/or registration services. Any results that are returned from a search request are based on finding a database match to the domain name as a keyword or literal string. Currently, there are no search engines or resources that generate a link for WHOIS results
- 10 in response to receiving a network address such as a domain name, FQDN, or URL and may be listed or redirected as part of search results.

- To date, search services, resolution services, and registration services have remained as separate services. New utility may be demonstrated by combining
- 15 these separate services into a unified service. Accordingly, in light of the above, there is a strong need in the art for a system and method for integrating resolution services, search services, and registration services.

Summary of the Invention

- 20 The present invention enables the seamless integration between resource location, search, and registration services. The invention enables a search request to be processed as a literal string, network address, or both. The present invention generates and displays at least one hyperlink at the top of standard search results where the link may access a URI or NIC registration of
- 25 an available domain name in the form of "keyword.TLD".

- The invention enables a plurality of identifiers to be processed as input and displayed as a resolution request. The present invention enables the integration of metalinks as part of search results and registration results. The invention
- 30 enables the use of identifier prefixes as a command language. The present invention enables a user to edit, list, obtain the status and history, select, renew,

transfer, escrow, auction, bid, value, purchase, sell, lease, redirect, lock, web host, incorporate, trademark, locate, and dial a domain name.

The present invention enables more specific error messages to be generated in response to an input request. The invention enables search results to be integrated a part of the results from a registration request. The present invention enables the integration of metalinks (e.g., maps, after market domain name information, etc.) as part of results from a WHOIS request. The invention enables distributed WHOIS caching to minimize network connection bandwidth.

10 The present invention enables the real-time display of registrant information that corresponds to a current URI. The invention enables automatic notification of any identifiers that may soon be available in response to accessing such an identifier.

15 In general, in accordance with the present invention, a method for processing a search request includes the steps of determining that the received search request includes an identifier having a valid domain name, determining whether the valid domain name is resolvable, resolving the identifier in response to determining that the valid domain name is resolvable, and processing a
20 registration request in response to determining that the valid domain name is not resolvable.

In accordance with other aspects of the present invention, a method for processing a search request includes the steps of determining that the search
25 request includes an identifier having a valid domain name, determining whether the valid domain name is available for registration, providing a registration form when the domain name is determined available for registration, and providing registrant information when the domain name is determined not available for registration.

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In accordance with yet other aspects of the present invention, a method for processing a search request includes the steps of determining that the search request includes at least one keyword, generating at least one domain name from the at least one keyword, generating at least one URI for each domain
5 name generated, processing the search request, and determining whether to provide any generated URIs while providing any search results from the processed search request.

In accordance with still other aspects of the present invention, a method for
10 processing a search request includes the steps of determining that the search request includes an identifier having a valid domain name, generating at least one URI from the valid domain name, processing the search request, and determining whether to provide any generated URIs while providing any search results from the processed search request.

15 In accordance with yet additional aspects of the present invention, a system which implements substantially the same functionality in substantially the same manner as the methods described above is provided.

20 In accordance with other additional aspects of the present invention, a computer-readable medium that includes computer-executable instructions may be used to perform substantially the same methods as those described above is provided.

The foregoing and other features of the invention are hereinafter fully described
25 and particularly pointed out in the claims. The following description and the annexed drawings set forth in detail one or more illustrative aspects of the invention, such being indicative, however, of but one or a few of the various ways in which the principles of the invention may be employed.

Brief Description of the Drawings

Fig. 1a illustrates an exemplary prior art web page after search results have been returned in response to a domain name being entered into a search text box.

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Fig. 1b illustrates an exemplary prior art top portion of a web page after search results have been returned from many search engines in response to a domain name being entered into a search text box.

10 Fig. 1c illustrates the bottom portion of the web page depicted in Fig. 1b.

Fig. 1d is a block diagram of an exemplary distributed computer system in accordance with the present invention.

15 Fig. 1e is a diagram depicting the location field or web page search request used in a conventional web browser.

Fig. 1f is a block diagram illustrating exemplary information records stored in memory in accordance with the present invention.

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Fig. 2a is a flowchart illustrating the steps performed by a prior art system for providing search results.

25 Fig. 2b is a flowchart illustrating the steps performed by a prior art system for providing search results including a hyperlink for any registered keyword or phrase.

Fig. 2c is a flowchart illustrating the steps performed for determining how to process received input in accordance with the present invention.

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Fig. 3a is a flowchart illustrating the steps performed for processing a resolution or registration request from a search request having a valid domain name in accordance with the present invention.

- 5 Fig. 3b is a flowchart illustrating the steps performed for integrating metalinks as part of search results in accordance with the present invention.

- Fig. 3c is a flowchart illustrating the steps performed for processing a resolution or registration request from a search request having a fictitious domain name in accordance with the present invention.
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- Fig. 3d is a flowchart illustrating the steps performed for integrating search results with available domain names that correspond to a given search request in accordance with the present invention.
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- Fig. 4a is a flowchart illustrating the steps performed for processing a renewal request in response to detecting a "renew" domain name prefix from an input request in accordance with the present invention.

- 20 Fig. 4b is a flowchart illustrating the steps performed for processing a registration request in response to detecting a "register" domain name prefix from an input request in accordance with the present invention.

- Fig. 4c is a flowchart illustrating the steps performed for processing a transfer request in response to detecting a "transfer" domain name prefix from an input request in accordance with the present invention.
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- Fig. 4d is a flowchart illustrating the steps performed for processing a purchase request in response to detecting a "buy" domain name prefix from an input request in accordance with the present invention.
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Fig. 4e is a flowchart illustrating the steps performed for processing a sale request in response to detecting a "sell" domain name prefix from an input request in accordance with the present invention.

- 5 Fig. 5a is a diagram depicting an exemplary configuration settings interface in accordance with the present invention for selecting how an input request may be processed.

Fig. 5b illustrates a web page having a request form and resulting content from the use of such a request form in accordance with the present invention.

Fig. 6a illustrates the prior art for the typical output of a search request.

Fig. 6b illustrates modifications to the output of the search request that extends the functionality of the search results in accordance with the present invention.

Fig. 6c illustrates the page source of the output discussed in Fig. 6b in accordance with the present invention.

20 Fig. 7a is a flowchart illustrating the steps performed by a prior art system for registering a domain name.

Fig. 7b is a top level flowchart illustrating the step performed of providing an error message in response to the determination that a domain name can not be generated or parsed in accordance with the present invention.

Fig. 7c is a flowchart illustrating the steps performed for providing search services in response to registration services in accordance with the present invention.

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Fig. 7d is a flowchart illustrating the steps performed for integrating search results with registration results in accordance with the present invention.

Fig. 7e is a flowchart illustrating the steps performed for extending functionality of WHOIS results in accordance with the present invention.

Fig. 7f illustrates the prior art of a typical WHOIS output for a domain name.

Fig. 7g illustrates the page source of modified WHOIS output to extend functionality in accordance with the present invention.

Fig. 8 is a flowchart of the steps performed for extending the functionality of an input request in accordance with the present invention.

Fig. 9a is an illustration of how results may be displayed in a web browser in accordance with the present invention.

Fig. 9b is a flowchart illustrating a methodology for notifying a client that a domain name is available or may soon be available for registration in accordance with the present invention.

Detailed Description of the Invention

The present invention will now be described with reference to the drawings, wherein like reference numerals are used to refer to like elements throughout.

Turning first to the nomenclature of the specification, the detailed description that follows represents processes and symbolic representations of operations by conventional computer components, including a local processing unit, memory storage devices for the local processing unit, display devices, and input devices. Furthermore, these processes and operations may utilize conventional computer components in a heterogeneous distributed computing environment, including

remote file servers, computer servers, and memory storage devices. These distributed computing components may be accessible to the local processing unit by a communication network.

- 5 The processes and operations performed by the computer include the manipulation of data bits by a local processing unit and/or remote server and the maintenance of these bits within data structures resident in one or more of the local or remote memory storage devices. These data structures impose a physical organization upon the collection of data bits stored within a memory
- 10 storage device and represent electromagnetic spectrum elements.

A process may generally be defined as being a sequence of computer-executed steps leading to a desired result. These steps generally require physical manipulations of physical quantities. Usually, though not necessarily, these

15 quantities may take the form of electrical, magnetic, or optical signals capable of being stored, transferred, combined, compared, or otherwise manipulated. It is conventional for those skilled in the art to refer to these signals as bits or bytes (when they have binary logic levels), pixel values, words, values, elements, symbols, characters, terms, numbers, points, records, objects, images, files,

20 directories, subdirectories, or the like. It should be kept in mind, however, that these and similar terms should be associated with appropriate physical quantities for computer operations, and that these terms are merely conventional labels applied to physical quantities that exist within and during operation of the computer.

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It should also be understood that manipulations within the computer are often referred to in terms such as adding, comparing, moving, positioning, placing, illuminating, removing, altering, etc., which are often associated with manual operations performed by a human operator. The operations described herein

30 are machine operations performed in conjunction with various input provided by a human operator or user that interacts with the computer. The machines used

for performing the operation of the present invention include local or remote general-purpose digital computers or other similar computing devices.

In addition, it should be understood that the programs, processes, methods, etc.

5 described herein are not related or limited to any particular computer or apparatus nor are they related or limited to any particular communication network architecture. Rather, various types of general-purpose machines may be used with program modules constructed in accordance with the teachings described herein. Similarly, it may prove advantageous to construct a
10 specialized apparatus to perform the method steps described herein by way of dedicated computer systems in a specific network architecture with hard-wired logic or programs stored in nonvolatile memory, such as read only memory.

Fig. 1d illustrates an exemplary system for providing a distributed computer
15 system 100 in accordance with one aspect of the present invention and may include client computers or any network access apparatus 110 connected to server computers 120 via a network 130. The network 130 may use Internet communications protocols (IP) to allow clients 110 to communicate with servers 120. The network access apparatus 110 may include a modem or like
20 transceiver to communicate with the electronic network 130. The modem may communicate with the electronic network 130 via a line 116 such as a telephone line, an ISDN line, a coaxial line, a cable television line, a fiber optic line, or a computer network line. Alternatively, the modem may wirelessly communicate with the electronic network 130. The electronic network 130 may provide an on-
25 line service, an Internet service provider, a local area network service, a wide area network service, a cable television service, a wireless data service, an intranet, a satellite service, or the like.

The client computers 110 may be any network access apparatus including hand
30 held devices, palmtop computers, personal digital assistants (PDAs), notebook, laptop, portable computers, desktop PCs, workstations, and/or larger/smaller

computer systems. It is noted that the network access apparatus 110 may have a variety of forms, including but not limited to, a general purpose computer, a network computer, a network television, an internet television, a set top box, a web-enabled telephone, an internet appliance, a portable wireless device, a television receiver, a game player, a video recorder, and/or an audio component, for example.

Each client 110 typically includes one or more processors, memories, and input/output devices. An input device may be any suitable device for the user to give input to client computer 110, for example: a keyboard, a 10-key pad, a telephone key pad, a light pen or any pen pointing device, a touchscreen, a button, a dial, a joystick, a steering wheel, a foot pedal, a mouse, a trackball, an optical or magnetic recognition unit such as a bar code or magnetic swipe reader, a voice or speech recognition unit, a remote control attached via cable or wireless link to a game set, television, and/or cable box. A data glove, an eye tracking device, or any MIDI device may also be used. A display device may be any suitable output device, such as a display screen, text-to-speech converter, printer, plotter, fax, television set, or audio player. Although the input device is typically separate from the display device, they could be combined; for example: a display with an integrated touchscreen, a display with an integrated keyboard, or a speech-recognition unit combined with a text-to-speech converter.

The servers 120 may be similarly configured. However, in many instances server sites 120 include many computers, perhaps connected by a separate private network. In fact, the network 130 may include hundreds of thousands of individual networks of computers. Although the client computers 110 are shown separate from the server computers 120, it should be understood that a single computer may perform the client and server roles. Those skilled in the art will appreciate that the computer environment 100 shown in Fig. 1d is intended to be merely illustrative. The present invention may also be practiced in other computing environments. For example, the present invention may be practiced

in multiple processor environments wherein the client computer includes multiple processors. Moreover, the client computer need not include all of the input/output devices as discussed above and may also include additional input/output devices. Those skilled in the art will appreciate that the present invention may also be practiced via Intranets and more generally in distributed environments in which a client computer requests resources from a server computer.

During operation of the distributed system 100, users of the clients 110 may desire to access information records 122 stored by the servers 120 while utilizing, for example, the Web. Furthermore, such server systems 120 may also include one or more search engines having one or more databases 124. The records of information 122 may be in the form of Web pages 150. The pages 150 may be data records including as content plain textual information, or more complex digitally encoded multimedia content, such as software programs, graphics, audio signals, videos, and so forth. It should be understood that although this description focuses on locating information on the World-Wide-Web, the system may also be used for locating information via other wide or local area networks (WANs and LANs), or information stored in a single computer using other communications protocols.

The clients 110 may execute Web browser programs 112, such as Netscape Navigator or MSIE to locate the pages or records 150. The browser programs 112 enable users to enter addresses of specific Web pages 150 to be retrieved. Typically, the address of a Web page is specified as a URI or more specifically as a URL. In addition, when a page has been retrieved, the browser programs 112 may provide access to other pages or records by "clicking" on hyperlinks (or links) to previously retrieved Web pages. Such links may provide an automated way to enter the URL of another page, and to retrieve that page.

Fig. 1e more specifically illustrates an exemplary selection of common operative components of a web browser program 112. The web browser 112 enables a user to access a particular web page 150 by typing the URL for the web page 150 in the location field 154. The web page 150 contents corresponding to the URL from the location field 154 may be displayed within the client area of the web browser display window 158, for example. Title information from the web page 150 may be displayed in the title bar 160 of the web browser 112. The web page 150 contents may further include a user interface element such as that of an input text box 162 for inputting search requests and, in turn, search results having identifiers 164 such as a hyperlink or URL.

Fig. 1f illustrates a block diagram of a processor 166 coupled to a storage device such as memory 170 in a client 110 and/or server 120 computing system. Stored in memory may be information records 122 having any combination of exemplary content such as lists, files, and databases. Such records may include for example: configuration settings 174, keyword/phrase registry 176, FDN registry 178, TLD cache 180, prefix database 182, Templates, 186, WHOIS cache 188, Available/expired names 190, Domain watch list 192, History folder 194, Bookmarks 196, and domain name status database 198. These information records are further introduced and discussed in more detail throughout the disclosure of this invention.

Fig. 2a is a toplevel flowchart illustrating the steps of an exemplary prior art system for processing a search request. A client system, network access apparatus 110, servlet, applet, stand-alone executable program, command line of a device such as a phone browser, or user interface element such as a text box object or location field 154 of a web browser 112, receives and parses a search request in step 210. The search request is sent to a server system 120 including a search engine/database 124 and search results having identifiers are retrieved in step 215 by the client system 110. The search request is generally passed as a query to access a database stored on the server system 120 and

the retrieved identifiers may represent network resources in the form of URLs or hyperlinks. Results, if any, are then notified, accessed, and/or displayed in step 220.

5 Fig. 2b is a toplevel flowchart illustrating the steps of an exemplary prior art system for combining search results of a search request and any portion of the search request having a registered phrase or keyword. A network access apparatus 110, servlet, applet, stand-alone executable program, command line
10 box object or location field 154 of a web browser 112, receives and parses in step 210 input such as text or voice. A combine flag is then cleared in step 225. A determination may be made in step 230 by consulting a keyword/phrase registry 176 as to whether the search request includes a registered phrase or keyword, and if not, then search results are retrieved in step 215. Since the
15 combine flag is determined in step 235 to not be set, then results if any, are provided in step 220.

However when it is determined in step 230 that the search request does include a registered phrase or keyword, then at least one URI may be retrieved in step
20 240 that corresponds to the registered keyword or phrase. A determination may be made in step 245 as to whether to redirect results to the retrieved URI. If so, then the page source of the URI is accessed in step 250 and results, if any, may then be notified, accessed, and/or displayed in step 220. However when it is determined in step 245 that results are not redirected to the URI then the
25 combine flag is set in step 255 and search results may be retrieved in step 215. Since the combine flag is determined in step 235 to be set, the hyperlink of the retrieved URI is combined in step 260 with search results, and such results if any, may then be notified, accessed, and/or displayed in step 220.

30 Fig. 2c is a flowchart showing steps in accordance with the present invention for determining how to process received input 210. After input is received and/or

any flags that may have been cleared, it may be determined in step 265 whether input includes no "." delimiters or " " delimiters only. When this is the case, then no domain name or IP address is present and input may be processed as a search request or it may further be determined in step 230, whether input

5 includes a registered phrase or keyword by consulting a keyword/phrase registry 176, otherwise it may be determined in step 270 whether input includes "." delimiters only or no " " delimiters. When the presence of the "." delimiter is determined, the input may include either an IP address or domain name. When a domain name is detected, the validity of the domain name is determined.

10 When input includes both at least one " " delimiter and at least one "." delimiter then it is determined in step 275 whether the input includes more than one identifier. When more than one identifier has been determined, then a window or frame for each identifier is generated and/or displayed in step 280. For example, when input such as "news.com wired.com" is received as input for a resolution

15 request or search request, a window for each domain name is opened (e.g., tiled as a split screen) for accessing content from each web site.

Fig. 3a is a toplevel flowchart illustrating the steps for integrating registration and/or resolution services with search services in accordance with the present

20 invention. When it is determined in step 230 that the search request does not include a registered phrase or keyword, then it may further be determined in step 310 whether the request includes a valid domain name (VDN). For example, a TLD cache 180 may be used as part of one aspect for determining validity. Validity of URI syntax is provided in T. Berners-Lee, "Informational RFC

25 (Request for Comment) 1630: Universal Resource Identifiers in WWW--A Unifying Syntax for the Expression of Names and Addresses of Objects on the Network as used in the World-Wide Web", Internet Engineering Task Force (IETF), June 1994, "<http://www.faqs.org/rfcs/rfc1630.html>", which is herein incorporated by reference.

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When the request is determined in step 310 to include a valid domain name, it may then be determined in step 315 whether to perform a search request with the input as a literal string. Search results may be retrieved in step 215. A search request may be initiated by selecting an exact phrase option from a
5 listbox or by surrounding the input with a delimiter such as the quote sign (e.g., "example.com") to process the detected domain name as a literal string, otherwise a domain name detected from input may be processed as a registration and/or resolution request. When it is determined that the input is instead processed in step 315 as a resolution and/or registration request, then
10 the resolvability and/or availability of the domain name may be determined in step 320. When the domain name is determined in step 320 to be not resolvable, then the domain name is processed in step 325 as a registration request. Domain name resolution is explained in P. Mockapetris, "Informational RFC (Request for Comment) 1035: Domain Names - Implementation and
15 Specification", Internet Engineering Task Force (IETF), November 1987, "<http://www.faqs.org/rfcs/rfc1035.html>", which is herein incorporated by reference.

A WHOIS request is performed to determine domain name availability. When a
20 domain name is already registered (e.g., determined not available), registrant information may be provided to the client system. However, when the domain name is available, a registration form may be processed and submitted to a registrar and/or registry and to its partners and/or affiliates. Specification of the WHOIS protocol is provided in K. Harrenstien, M. Stahl, and E. Feinler,
25 "Informational RFC (Request for Comment) 954: NICNAME/WHOIS", Internet Engineering Task Force (IETF), October 1985, "<http://www.faqs.org/rfcs/rfc954.html>", which is herein incorporated by reference.

When it is determined in step 320 that the domain name is resolvable and further
30 determined in step 330 that the search request includes a valid URI then the page source of the URI may be accessed in step 250 and results, if any, may

then be notified, accessed, and/or displayed in step 220. When the search request does not include a valid URI as determined in step 330, then a valid URI may be generated in step 335 and the page source of the URI may then be accessed in step 250.

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Fig. 3b illustrates how search results may be enhanced by providing links to URIs of meta-information generated from domain names in accordance with the present invention. When it is determined in step 315 that a valid domain name is to be processed as a search request, the determination of whether to integrate links of meta-information or "metalinks" may be determined in step 340. When metalinks are to be integrated then at least one metalink may be generated in step 345 and included with any search results (step 215) where such metalinks may access any permutation of the following; URI of the domain name, WHOIS of the domain name, page source of the URI, HEAD request of URI, sitemap of URI, and domain name status or the like. Domain name status may indicate whether the domain name is available for sale, license, or lease by the registrant or through an auction and/or listing service. If metalinks are not integrated, then search results may be retrieved in step 215. Templates 186 may be used to generate metalinks.

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In a hierarchical naming system such as the DNS, a first domain may represent the highest level domain (HLD). A HLD that is determined not resolvable is referred to as a Top Level Domain Alias (TLDA) whereas a resolvable HLD is referred to as a Top Level Domain (TLD). Any domain name that is not valid or any domain name having a TLDA is called a fictitious domain name (FDN). More information on FDNs may be found in co-pending patent applications (60/125,531; 60/135,751; 60/143,859; 09/532,500).

Fig. 3c illustrates how FDNs may be integrated with search services in accordance with the present invention. When it is determined in step 230 that the search request does not include a registered phrase or keyword, then it may

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further be determined in step 350 whether the search request includes a FDN, by consulting a FDN registry 178. When the request is determined in step 350 to include a FDN, it then may be determined in step 315 whether to perform a search request with the input as a literal string. Search results may be retrieved in step 215. A search request may be initiated by selecting an exact phrase option from a listbox or surrounding the FDN with a delimiter such as the quote sign (e.g., "top.stories") to process the detected FDN as a literal string, otherwise a FDN detected from input may be processed as a registration and/or resolution request. When it is determined that the input is instead processed in step 315 as a resolution and/or registration request, then the resolvability and/or availability of the FDN may be determined in step 320.

However, when it is determined not to process the input in step 315 as a search request, then it may be determined in step 360 whether the FDN is registered. When the FDN is to be registered, then a valid URI having a VDN is generated in step 365 from the FDN and the page source of the URI is accessed in step 250 and results, if any, may then be notified, accessed, and/or displayed in step 220. However, when it is determined in step 360 that the FDN is not registered, then the FDN may be processed in step 370 as a registration request. More information with respect to processing step 365 and/or step 370 may be found in co-pending patent applications (60/125,531; 60/135,751; 60/143,859; 09/532,500).

Fig. 3d illustrates how search results may be enhanced by providing links to URIs generated from keywords in accordance with the present invention. When it is determined that input is not a VDN, FDN, or registered keyword/phrase then it may be further determined in step 375 whether input is processed as an enhanced search request by consulting the configuration settings 174. If not, then search results are retrieved in step 215. However, when an enhanced search request is determined in step 375 to be processed, then it may be determined in step 380 whether the search request is a single keyword. When

the search request is a single keyword then at least one hyperlink is generated in step 385 and displayed at the top of search results (step 215) where additional links/metalinks may access the URI, WHOIS, and/or NIC registration of an available domain name in the form of "keyword.TLD". For example, "cars" is an entered keyword and returns metalinks of "cars.com", "cars.net", or the like in addition to search results on the keyword "cars".

When a search request has more than one keyword then at least one hyperlink may be generated in step 390 and displayed at the top of search results (step 215). A link/metalink may access the URI, WHOIS, and/or NIC registration of available domain name in the form of "combinedkeywords.TLD" (e.g., "best price" yields "bestprice.com" and "pricebest.com", etc.). The availability of such generated domain names may be determined in real-time by performing a plurality of WHOIS requests. Links may be displayed for all domain names determined available for registration. Additional domain names may be generated and/or determined available by adding word variations to a domain name (e.g., the word "now" yields "nowbestprice.com", "bestpricenow.com").

A domain name may be considered an object having many properties or attributes, methods, and events. For instance, a domain name may be bought, sold, leased, escrowed, transferred, edited, auctioned, listed, locked, trademarked, dialed, e-mailed, registered, and resolved or the like. A domain name may be considered a global network identifier. All such attributes may be used as prefixes for determining how a domain name is processed during any kind of request (e.g., resolution, search, and/or registration request). For instance, a prefix and domain name may be entered into a search text box, directly from the location field of a web browser, or received as text from a speech to text decoder.

Similar to how the MSIE Autosearch feature processes search request prefixes as specified in the '459 patent, more prefixes may be defined to satisfy requests

other than that of search requests. A template 186 may be defined for each domain name prefix and used for generating a corresponding URL to perform a specific request, function, or result. For instance, the command "transfer example.com" or "transfer example.com from RegistrarA to RegistrarB" may be entered. The prefix "transfer" is detected and a search engine script or the MSIE Autosearch feature will insert the domain name "example.com" into a template to generate a URL which is used to redirect the client to registrar services for the specific purpose of transferring "example.com" from a current registrar to a newly selected registrar. Figs. 4a through 4e illustrate steps performed for some commonly used prefixes. However, similar steps may be applied by those skilled in the art for any prefix and/or suffix that may perform an operative function for numerous types of identifiers (e.g., domain name, telephone number, IP address, ISBN, UPC, SKU, Driver's License, Trademark Number, Patent Number, Social Security Number, keyword, FDNs, screen name, username, alias, handle, phrase, slogan, etc.). Other domain name prefixes are shown in more detail in Fig. 5b.

Fig. 4a illustrates how a "renew" prefix may be used as part of a search request to initiate registration services in accordance with the present invention. After a search request is received and parsed in step 210, it is then determined in step 410 whether the prefix "renew" was parsed. If not, then it may be determined in step 230 as to whether the search request includes a registered phrase or keyword. When it is determined in step 410 that the prefix "renew" was parsed, it is then determined in step 412 how the prefix request is processed. First, it may be determined in step 415 whether the request includes a registered phrase or keyword. If so, then the registered phrase or keyword is redirected in step 420 to a registrar for the purposes of processing in step 450 a renewal registration request. When it is determined in step 415 that the request does not include a registered phrase or keyword, then it may be determined in step 425 whether the request includes a valid domain name. If so, then the valid domain name is redirected in step 430 to a registrar for the purposes of processing in

step 450 a renewal registration request. When it is determined in step 425 that the request does not include a valid domain name, then it may be determined in step 435 whether the request includes a FDN. If so, then the FDN is redirected in step 440 to a registrar for the purposes of processing in step 450 a renewal registration request. When it is determined in step 435 that the search request does not include a FDN, then search results may be retrieved in step 215.

Fig. 4b illustrates how a "register" prefix may be used as part of a search request to initiate registration services in accordance with the present invention. After it is determined in step 410 that the prefix "renew" was not parsed, it then may be determined in step 455 whether the prefix "register" was parsed. If not, then it may be determined in step 230 as to whether the search request includes a registered phrase or keyword. When it is determined in step 455 that the prefix "register" was parsed, it is then determined in step 412 how the prefix request is processed. If the parsed prefix does not result in processing a registration request in step 460 then search results may be retrieved in step 215.

Fig. 4c illustrates how a "transfer" prefix may be used as part of a search request to initiate transfer services in accordance with the present invention. After it is determined in step 455 that the prefix "register" was not parsed, it then may be determined in step 465 whether the prefix "transfer" was parsed. If not, then it may be determined in step 230 as to whether the search request includes a registered phrase or keyword. When it is determined in step 465 that the prefix "transfer" was parsed, it is then determined in step 412 how the prefix request is processed. If the parsed prefix does not result in processing a transfer request in step 470 then search results may be retrieved in step 215.

Fig. 4d illustrates how a "buy" prefix may be used as part of a search request to initiate purchasing services in accordance with the present invention. After it is determined in step 465 that the prefix "transfer" was not parsed, it then may be determined in step 475 whether the prefix "buy" was parsed. If not, then it may

be determined in step 230 as to whether the search request includes a registered phrase or keyword. When it is determined in step 475 that the prefix "buy" was parsed, it is then determined in step 412 how the prefix request is processed. If the parsed prefix does not result in processing a purchase request in step 480 then search results may be retrieved in step 215.

Fig. 4e illustrates how a "sell" prefix may be used as part of a search request to initiate selling services in accordance with the present invention. After it is determined in step 475 that the prefix "buy" was not parsed, it then may be determined in step 485 whether the prefix "sell" was parsed. If not, then it may be determined in step 230 as to whether the search request includes a registered phrase or keyword. When it is determined in step 485 that the prefix "sell" was parsed, it is then determined in step 412 how the prefix request is processed. If the parsed prefix does not result in processing a selling request in step 490 then search results may be retrieved in step 215.

Fig. 5a illustrates user modifiable configuration settings 174, which may be accessed for determining how to process an input request. Configuration settings 174 may include general features 520, search features 530, and registration features 540. General feature settings 520 may include a method for selecting redirection to a registrar and/or search engine. Such settings may further include the enabling of a watch list (see Fig. 9b), prefixes (e.g., registration commands), and/or the enabling of metalinks. Enhanced search features 530 may include combining search results with the generation of domain names in response to a search request and/or providing a means for registering any input determined to be available (e.g., VDN, FDN, keyword or phrase). Enhanced registration features 540 may include combining registration results with the results of a search request from the input of a registration request and/or the ability to include resource location in response to a registration request. Other configuration settings that are not shown may be applied by those skilled in the art to perform any aspect of the present invention.

Fig. 5b illustrates a web page having a request form and resulting content from the use of such a request form. A web page 150 may include a user interface element such as a location field 154 or search text box 162 for receiving an input request. Other user interface elements such as button objects 550, list boxes 554, and menu lists may also be included. For example, button objects 550 (e.g., Search, Resolve, Multi) may be used to process an input request. A Search button may process input as a search request. A Resolve button may process input as a resolution request. A Multi button may integrate the results of a search, resolution and/or registration request. For this illustration, a list box 554 may include a plurality of prefixes used for processing an identifier such as a domain name as input received from a location field 154 or search text box 162. For example, When "best price" is entered as input, results of generated domain names determined to be available 560 are displayed in conjunction with search results for "best price" 564. In addition, metalinks may also be integrated 568 with search results and/or resolution request. For instance, the search engine may consult a domain name status database 198 and determine that the domain name "bestprice.com" is currently for sale. A metalink for accessing more information on the sale or after market status of the domain name is generated and integrated 568 with search results.

Identifier prefixes may be used as a command language by entering such a prefix in conjunction with an identifier and/or other parameters into a user interface element such as a microphone with speech to text translation, a web browser location field 154, a web page search text box 162, or command line of a computing device, etc. Such prefixes may also be selected from a list of prefixes as a means for processing an identifier as input. A prefix database 182 may be used in conjunction with templates 186 to generate a URI that may be used for processing an operative function upon the identifier that corresponds to the selected prefix. The following are examples of how prefixes may be used for domain names.

"Edit example.com" may enable a registrant of the domain name "example.com" to edit contact information stored in the registrar database. "Handle example.com" may enable a user to list or edit any handles that may correspond to the domain name "example.com". "List example.com" may enable a user to display all records that may correspond to "example.com". "Status example.com" may enable a user to review the current status of "example.com". "History example.com" may enable a user to review the transaction history of "example.com". "Watch example.com" may enable a user to add "example.com" to a watch list for notifying the user as to similar domain names registered or to notify that "example.com" is available or may soon be available for registration. "Renew example.com" enables a registrant to extend the expiry date of "example.com" and provide the option of transferring from one registrar to another. "Transfer example.com RegistrarA to RegistrarB" may enable a registrant to transfer "example.com" from a current registrarA to a new registrarB. "Escrow example.com" may enable a registrant to hold "example.com" in escrow for the purposes of transferring the domain name. "Consolidate example.com" may enable a registrant to list all of the registered domain names of a registrant or given handle for the purpose of minimizing renewal payments across a portfolio of domain names.

"Auction example.com" may enable a registrant to list "example.com" for auction". "Bid example.com" may enable an entity to make a bid on "example.com". "Value domain name" may enable a user to receive an estimate of the book value or inventory value for "example.com". "Buy example.com" may enable an entity to make a solicitation for purchase or to purchase "example.com" from the current registrant. "Sell example.com" may enable a registrant to list "example.com" for sale. "Lease example.com" may enable an entity to make a solicitation for leasing or to lease "example.com" from the current registrant.

"Generate example.com" may generate a variety of related domain names that are available (e.g., "firstexample.com", "anotherexample.com", etc.). "WHOIS example.com" may enable a user to list the WHOIS record for "example.com". "Expire example.com" may enable a user to list the expiration date for

5 "example.com". "Registrar example.com" may enable a user to list which registrar "example.com" is registered with. "Tools example.com" may enable an entity to use online tools to find more information on "example.com" such as zone files, nameservers, subdomains, and the like. An example of such online tools may be accessed from a URL such as "http://domtools.com/domtools/".

10 "Redirect example.com" may enable a registrant to configure "example.com" to redirect to another URL. "Lock example.com" may enable a registrant to assure that "example.com" may not be transferred to another registrar until the registrant unlocks the domain name.

15 "Email example.com" may enable a registrant to sign up for email services for "example.com". "Webhost example.com" may enable a registrant to sign up for web hosting services for "example.com". "Inc example.com" or "LLC example.com" may enable a registrant to submit articles or incorporation/organization and form a business entity for "example.com".

20 "Trademark example.com" may enable a registrant to file a trademark for "example.com". "Geo example.com" may enable a user to receive GPS coordinates from a GPS system or the current latitude/longitude for "example.com". "Dial example.com" may enable a user to make a telephone call to a phone number designated by the registrant of "example.com". For instance,

25 the URL "http://example.com/index.html" may launch a dialer program or redirect to an Internet telephone protocol for contacting the registrant instead of or in addition to accessing a web site. Domain names are generally used as identifiers to access a web site or the like. There are no such domain names used for the explicit purpose of dialing a telephone number instead of accessing

30 a web site. Specification of an Internet telephone protocol is provided in A. Vaha-Sipila, "Informational RFC (Request for Comment) 2806: URLs for

Telephone Calls", Internet Engineering Task Force (IETF), April 2000, "http://www.faqs.org/rfcs/rfc2806.html", which is herein incorporated by reference.

5 Fig. 6a illustrates a typical output from the results of a search request. The search request used is the phrase "software patent". For illustrative purposes, only the first four search results are shown. The first line of a given result may be underlined indicating a hyperlink reference. The hyperlink accesses the URL displayed in the last line of each given search result.

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Fig. 6b illustrates modifications made to the output of the search request to extend functionality of the search results. A second line of metalinks may be added to each search result enabling the user to retrieve meta-information about the URI such as WHOIS, Homepage, <META> tag Information, Page Source, Sitemap information, and after market domain name status. Steps (420, 430) for providing such added results are shown in Fig. 4. For instance, the URI for a sitemap may be determined from a variety of methods including access to a sitemap database 184, which may be compiled from a web site such as "sitemap.net" or maintained by having a "crawler" program interrogate the web site of the URI by searching for a sitemap link on the homepage or any other accessible web page or by finding a directory called "sitemap" or a filename called "sitemap.htm" (or ".html"). The after market domain name status may be determined in a similar manner to that of a sitemap. A domain name status database 198 may be maintained by having a "crawler" program interrogate a myriad of after market web sites that list and/or auction domain names.

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Fig. 6c illustrates the page source of the output shown in Fig. 6b. By extracting the domain name from the URI, other URIs may be generated and displayed to yield meta-information based on the context of the original URI. Though direct links to meta-information are shown; such links may first access a central source and then URI redirection may be applied to track visits, IP addresses, previous

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URIs, demographic information, etc. for the purposes such as accounting, marketing, advertising, and distribution.

When a domain name is received as input to a registration service, the
5 availability of the domain name is determined. If the domain name is not
available, registrant information is returned and the client is notified that the
domain name in question is not available and may provide the option of checking
the availability of other domain names. When a domain name is available, a
user may be presented with the choice of registering the domain name. Upon
10 completion of registration, another domain name may then be checked for
availability.

Fig. 7a illustrates such a registration service. A device such as a network access
apparatus 110, servlet, applet, stand-alone executable program, or a user
15 interface element such as a text box object, receives and parses input in step
704. It is then determined in step 706 whether a valid domain name may be
parsed or generated from input. When input can not be processed as a
registration request then an error message may be provided in step 708
otherwise a registration request may be processed in step 710 for each valid
20 domain name. To process such a request, availability of the domain name 306
may be determined in step 714. If the domain name 704 is determined to not be
available in step 314, then a record from a corresponding WHOIS database may
be retrieved and displayed in step 718. Because WHOIS requests are so heavily
relied on, methods for minimizing network bandwidth of these services are
25 considered preferable. For instance, a browser 112 may be configured to first
access a client WHOIS cache and/or a series of distributed WHOIS caches 188
to increase lookup performance. Such caches may be distributed in a manner
similar to the DNS wherein each WHOIS cache may make further hierarchical
reference to the next successive WHOIS cache until a definitive result has been
30 found.

When the domain name 704 is determined available in step 714, then such information may be displayed accordingly, prompting the client to register the domain name in step 722. When it is determined in step 722 that the client may wish to register the domain name 704, further information may be displayed to assist the user in registering the domain name in step 726.

Fig. 7b is a top-level flowchart showing how an error message may be used in accordance with the present invention. When it is determined in step 706 that a valid domain name may not be parsed or generated from input, a more specific error message is provided in step 730 that may include hyperlinks to determine whether input may be a registered identifier in another namespace or a link to process input as a search and/or resolution request. In addition, further options such as modifying configuration settings 174 may also be included as hyperlinks in such a resulting web page or error message.

Fig. 7c is a flowchart illustrating a methodology for performing a search request after a completed registration request. After the registration request is processed in step 710, it may be determined in step 740 by accessing configuration settings 174 whether a search request may be processed. More specifically, it may be further determined in step 744 whether received input is to be processed as a search request in step 748. When this is the case, a search request is constructed from the identifier (e.g., domain name) and processed in step 748 and results if any may then be notified, accessed, and/or displayed in step 752.

Fig. 7d is a flowchart illustrating a methodology for combining the results of performing a search request while processing a registration request. When input is parsed and received in step 704 it is determined in step 760 whether search results may be combined with results from the registration request (step 710) by accessing configuration settings 174. When this is the case, search results from input may be retrieved in step 764. If not, then it may be determined in step 768

auction site, listing service, domain name broker, or the like. The domain name status database 198 is consulted in response to the WHOIS request and zero or more hyperlinks of after market information may be generated and integrated into the page source from the results of the WHOIS request.

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Referring now to Fig. 8, steps are illustrated which show how a resolution request or search request may be modified to extend functionality. A device such as a network access apparatus 110, command line, servlet, applet, script, stand alone executable program having an input object such as a text, or web browser 112 receives 710 input having a domain name. When input is received in step 710, it may be determined in step 810 whether the input is a valid URI. When the input is a valid URI, then a second URI may be generated in step 815 from the domain name of the valid URI for accessing a WHOIS record corresponding to the domain name. However when the input is not a valid URI, then a URI may be generated in step 820 from the input and then a second URI may be generated in step 815 from the domain name of the generated URI to access a WHOIS record corresponding to the domain name. In either case, a web page with two frames may be generated and displayed in step 825 having both the content of the generated or valid URI (810, 820) and the second URI 815.

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Turning now to Fig. 9a, illustrations of web pages are displayed which correspond to steps shown in Fig. 8. A client 110 web browser 112 having a web page 910 may be used to connect to a server 120 via the Internet 130 that runs a CGI script 914. The location field of the web browser 112 is suppressed and the web page 910 displays at least two frames. The first frame is the web based location field 918 and the second frame 922 may be used to display the contents 150 of a web address. An input device (e.g. keyboard, mouse, pen light, touch screen, or microphone etc.) of a client computer or network access apparatus 110 is used to receive a web address as input either directly from a hyperlink (not shown) in the web page 910, or from the location field 918 of the

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web page 910. A URL GET or POST request may be generated from the input and the browser 112 forwards the request to a server 120, which processes the request by executing a CGI script 912 to generate output (as discussed in Fig. 8) by requesting the generated pages 910' and sending the content (930, 934) to the browser 112. The location field 918 of the first frame may either persist by displaying the input or may be cleared for the next web address. The content 150 of the input URI may be displayed in a first frame 930 of the web page 910' whereas the content of the second frame 934 may be dynamically generated by corresponding the extracted domain name from the input URI as a search term to generate a second URI which corresponds to a WHOIS record of the domain name. For instance, when a first URI "http://www.example.com/page1.htm" is received as input, a script extracts "example.com" from the URI and generates a second URI:

"http://www.networksolutions.com/cgi-bin/whois/whois?example.com"

Both the first URI and second URI may be generated as frames and displayed as a web page 910'. The content of the first page 922 may already have the results of the URI "http://www.example.com/page1.htm", in which case, a third frame 926 having hyperlinks of dynamically generated URI meta-information such as WHOIS, Homepage, <META> tag information, Page Source, Sitemap, and after market status information (as discussed in Fig. 6b) may be displayed. These hyperlinks dynamically extract the domain name from the current URI to form metalinks on the fly so that at any given time one may access meta-information of the current URI. For instance, when clicking on the WHOIS metalink, the web page 910' as discussed above is generated and may display meta content as a split screen or in a pop-up window, etc.

The following discussion introduces certain concepts required for understanding the object oriented developer environment and the object oriented programming environment employed to construct the preferred embodiment and carry out the methods of the present invention. It is assumed here that the reader is familiar

with the notion that an "object", for purposes of computer modeling, comprises a plurality of data items or properties, has a behavior, responds to messages from other objects, and issues messages to other objects. It will be understood that the invention could be made and used with any object-oriented development
5 environment, such as C++, Java, or other object-oriented programming environment.

Various terms have emerged in the art to capture various aspects of "object-oriented" approaches. These terms include the words encapsulation, classes,
10 inheritance, message-passing, and polymorphism. The term "classes" relates to objects of similar types. Objects of the same class are grouped together and have certain properties, attributes, or behaviors in common. Classes may be organized into hierarchies of subclasses in which the procedures and attributes of the class are inherited by its subclasses. Thus, a "subclass" is a group of
15 objects that have some properties, attributes, behaviors, or procedures with other groups of objects, but could have other properties, attributes, behaviors, or procedures that are different. The term "attribute" or "property" relates to data items or information or behavior that relates to a particular object. The term "inheritance" means the sharing of properties, and in some cases, attributes and
20 behaviors, that characterizes a subclass by its parent class. The notion of inheritance purportedly allows for easier maintenance and extension of computer programs since creation of subclasses purportedly allows the program code used to created the parent class to be readily modified and reused for subclasses. An object's "procedures" or "methods" are operations upon data
25 items, attributes, and/or properties so as to cause a computing result and provide a response. Certain aspects of object-oriented programming techniques are utilized in the present invention so as to provide extended functionality to the user interface as applied to network systems.

30 There is a specific model called document object model (DOM) that defines a set of classes used for the manipulation of document objects. JavaScript is a

scripting language that relies on DOM when making function calls for Internet related applications. Most of these objects are directly related to characteristics of the Web page or browser. There is a class of objects specifically applied to the manipulation of URLs, which for the purposes of discussion is called a URI object.

In an aspect of the present invention a new object is instantiated called a MetaURI Object, which inherits the properties and is a subclass of the URI object. In addition, other objects (e.g. WHOIS Object, HLD Object, etc.) are instantiated, which are subclasses of the MetaURI object. It is desirable for a user to obtain meta-information at any given time during a user's navigation experience (e.g. on the Internet, Intranet or a web cache or file system offline, etc.). As each URI is accessed the properties of the MetaURI object are updated including any other related objects such as the WHOIS object to reflect values associated with the current URI. In turn, any associated document objects are automatically updated as well. There are many applications for the WHOIS object. For instance, the WHOIS object may be integrated into bookmarks (including favorites folder), URL history folder, or even as part of the location field. In addition, by using any menu such as a right-click menu or an action menu, an extra option is listed to retrieve WHOIS information based on the URI properties of the selected object. A modified WHOIS function is programmed to extract a domain name from the URI property to be passed as a parameter for retrieving contact information from the proper WHOIS database.

Bookmarks in Netscape are stored in an HTML file having an anchor reference tag for maintaining the properties of a given bookmark when used in conjunction with a bookmark viewer. The following is an example of one such reference.

```
<A HREF="http://164.195.100.11/netahtml/search-adv.htm"
ADD_DATE="952124784" LAST_VISIT="25920000"
LAST_MODIFIED="25920000">USPTO</A>
```

In another aspect of the present invention modifications may be made to the bookmark viewer so that an extra WHOIS field may be added to the anchor reference when a page is bookmarked.

<A HREF="http://164.195.100.11/netahtml/search-adv.htm"

5 ADD_DATE="952124784" LAST_VISIT="25920000"
LAST_MODIFIED="25920000" WHOIS="http://www.networksolutions.com/cgi-bin/whois/whois?uspto.gov">USPTO

The history folder 194 or domain name status database 198 may be modified in
10 a similar manner except that due to its size such data is saved in a compressed format. For instance, by enabling the history folder 194 to correspond metalinks in real-time while surfing the network, a WHOIS cache 188 may be generated as each URI is being requested. This information may be used for reviewing registrant information while offline from the network, for example.

15 Domain names that are soon to be available may be distributed in advance to a user so that domain names of interest may be selected and reserved in a preordering queue on either the client or server side. Registration information is completed and a registration form is submitted to or by a registrar when the soon
20 to be available domain name that is selected does become available.

Fig. 9b is a flowchart illustrating a methodology for notifying a client that a domain name is available or may soon be available for registration. A WHOIS record may be retrieved by initiating a WHOIS request or retrieved in response to
25 processing a resolution request, search request, and registration request. Whatever the case, whenever a WHOIS record is retrieved (step 950), the expiration date for the domain name of the WHOIS record is parsed and compared in step 954 to the current date. When the difference between the expiration date and current date is determined in step 958 to be less than a
30 predetermined threshold value (e.g., 30 days), a client may be notified in step 962 that the domain name may soon be available. Upon notification, the client

